

REMARKS

In paper 18 of parent application 09/895,679, the Examiner rejected the pending claims

under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Paper 18, page 2. In particular, the Examiner alleged that the application did not support the limitation "antiferromagnetically." In a subsequent telephone interview, the Examiner also alleged that the application did not support limitations related to thermal stability. In response thereto, Applicants canceled '679 claims 1, 17, 23, 24, 26, 28-30, 32 and 34, and amended claims 11, 12, 15, 16, 18 to overcome the rejection. (See the Amendment sent by FAX to the USPTO on 12/9/03.) The '679 application was then allowed.

Applicants are re-presenting claims 1, 11-16 and 18 as they stood rejected in the above-mentioned paper 18 for prosecution in the present application. To facilitate examination of this case, below is a table listing the '679 claims and the corresponding claims submitting herewith:

<u>'679 Claims</u>	<u>Claims Submitted Herewith</u>
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1	1
11	10
12	11
13	12
15	13
16	14
18	15
30	16

Claims 17-23 are new. Claim 17 is similar to claim 1, except that claim 17 refers to “an antiferromagnetic exchange field H_{ex} exerted by the upper ferromagnetic metallic layer on the lower ferromagnetic metallic layer.” Claim 17 is supported in the application for reasons described below.

Claim 18 is supported at page 4, lines 10-13. Claim 19 is supported at page 4, lines 14-16 and page 6, line 13. Claim 20 is supported at page 5, lines 12-18. Claims 21 and 23 are similar to claim 16.

Claim 22 is similar to claim 1 except that claim 22 refers to “an antiferromagnetic interface exchange energy density J_{ex} .” Claim 22 is supported in the application for reasons described below.

The Specification Supports the Antiferromagnetic Coupling Limitation

As mentioned above, claim 1 in the present application is identical to claim 1 in the parent ‘679 application before it was canceled. The sole issue is whether the antiferromagnetic limitation is supported in the ‘679 application. In the ‘679 application, Applicants submitted evidence demonstrating that antiferromagnetic coupling was inherent in the structure disclosed in the specification. See, for example, the Declarations of Dr. Christopher H. Bajorek executed February 3, 2003 (¶2-5), April 10, 2002 (¶6-10), September 9, 2003, and in particular, the hysteresis curves shown in Exhibit B of the 2/3/03 declaration manifesting the antiferromagnetic coupling.¹ The Examiner

disagree(d) with this assertion on the grounds that *the antiferromagnetic coupling* of the film disclosed by Carey et al. (the film being substantially the same as that claimed by Applicant) is overcome for large applied fields and the moments of the magnetic films are actually parallel to one another. Thus, the presence of antiferromagnetic coupling is clearly a more complicated

¹ Copies of these declarations are submitted herewith.

phenomenon based on the materials and thicknesses of the layers but also the strength of the applied field as a result of the values of H_{ex2} and H_{c2} .

Advisory Action dated 11/17/03, page 2, emphasis in original. Applicants respectfully submit that this remark confuses the issue. During writing, a read-write head of a magnetic disk applies a write magnetic field to a magnetic disk. For a magnetic disk comprising two magnetic layers that are antiferromagnetically coupled to one another, during application of the write field the magnetization directions of the two layers are parallel, as the write magnetic field overcomes any antiferromagnetic coupling that might exist between the layers. Application of a write magnetic field to a location on a magnetic disk is very brief (e.g. on the order of 5 nanoseconds). After writing, the applied magnetic field at that location falls to zero quickly because the disk rapidly spins, and the location written to moves away from the read-write head. The fact that a write field temporarily overcomes antiferromagnetic coupling for an extremely brief period of time has nothing to do with the fact that antiferromagnetic coupling inherently exists in a disk comprising two Co alloy magnetic layers separated by an Ru interlayer having a thickness from 3 to less than 10 angstroms. Attached hereto is a supplemental Declaration of Dr. Christopher H. Bajorek evidencing the above-mentioned facts. See ¶3-9.

In the parent '679 application, Applicants' attorney submitted the above-mentioned Dr. Bajorek's 9/9/03 declaration answering other allegations raised by the Examiner that Carey implied that antiferromagnetic coupling was not inherent. These declarations are evidence that the Examiner misinterprets Carey, and in point of fact, antiferromagnetic coupling inherently exists in a magnetic recording medium comprising two ferromagnetic Co alloy layers separated by an interlayer made of Ru from 3 to less

than 10Å thick. The Examiner has provided no evidence whatsoever that her interpretation of Carey is correct. The only evidence of record is the Bajorek declarations which disprove the Examiner's assertions. Therefore, the present claims must be allowed.

Attached hereto as exhibit A is a copy of In re Adams and Fauser, 150 USPQ 646 (CCPA 1966). Adams holds that when an Applicant submits a declaration indicating how a prior art patent should be understood, it is illegal for the Examiner to reject a claim based on his or her own suppositions concerning the reference. Since there is absolutely no evidence contradicting Dr. Bajorek's interpretation of Carey, and there is no evidence contradicting anything else stated by Dr. Bajorek, his declarations must be accepted as accurate.

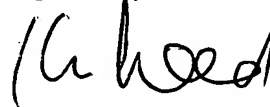
Claims 17-23 Are Supported by the Specification

During prosecution of the parent '679 application, the Examiner interpreted Carey as teaching that antiferromagnetic coupling only exists if $H_{ex2} > H_{c2}$. For reasons set forth in the 9/9/03 Bajorek declaration, this interpretation is incorrect. However, in order to sidestep any dispute concerning the meaning of the term "antiferromagnetic coupling", new claim 17 recites "wherein said interlayer causes an antiferromagnetic exchange field H_{ex} exerted by the upper ferromagnetic metallic layer on the lower ferromagnetic metallic layer." As explained in the accompanying Declaration (§10 and 11), this phenomenon is inherent in a magnetic recording medium comprising first and second ferromagnetic metallic layers comprising cobalt separated by an Ru interlayer having a thickness from 3 to less than 10Å. There is nothing in Carey that contradicts this fact.

Claim 22 is similar to claim 17, except that it refers to “an antiferromagnetic interface exchange energy density J_{ex} .” Carey states that $H_{ex2} = J_{ex}/M_2t_2$. (See col. 6, line 17.) Dr. Bajorek demonstrates that the antiferromagnetic interface exchange energy density J_{ex} is inherent for a magnetic recording medium comprising first and second ferromagnetic metallic layers comprising cobalt separated by an Ru interlayer having a thickness from 3 to less than 10Å. (§12 and 13.) There is nothing in Carey that contradicts this fact.

If the Examiner’s next action concerning this case is other than allowance, the Examiner is respectfully requested to contact Applicants’ attorney at (408) 732-9500 for a telephone interview.

Respectfully submitted,



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